

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
)
Amendment of the Commission's Part 90 Rules) WT Docket No. 06-49
In the 904-909.75 and 919.75-928 MHz Bands)

REPLY COMMENTS

OF

PROGENY LMS, LLC

June 30, 2006

SUMMARY

This proceeding, by undertaking a re-examination of the Federal Communications Commission's ("the "Commission's") Multilateration-Location and Monitoring Service ("M-LMS") rules, provides an important opportunity for the Commission to facilitate viable licensed services in the public interest in the 904-909.75 MHz and 919.75-928 MHz spectrum bands. The above-captioned Notice of Proposed Rulemaking ("NPRM") outlines a way forward, based on sound technology for interference mitigation, to promote effective spectrum usage for all users in this band, to facilitate valuable new homeland security and public safety services, and to furnish incentives for all systems to adopt spectrum-efficient technologies. In short, the flexibility changes contemplated in this proceeding will enable the Commission to continue building on a foundation of 21st century spectrum policy that has focused on sharing in order to promote the highest and best use of finite spectrum resources for multiple users.

FCC policies that have been introduced and expanded upon in the decade since the M-LMS Part 90 rules were last updated call for the Commission, at long last, to update the regulatory regime for these licensees. These Commission policies include the application of flexibility for spectrum-dependent services for not just unlicensed users, but across most licensed bands to promote technology innovation and investment for consumer and

homeland security services. Spectrum sharing, as evidenced in recent implementation efforts toward a spectrum-sharing innovation test bed under the President's Spectrum Initiative, also has become a hallmark of Commission and Executive Branch policy.

Sharing opportunities, in bands such as 5 GHz, have provided a two-way street to enable both licensed providers and unlicensed operators to meet new requirements and deploy advanced services. Finally, federal policy has accelerated a transformation in location-based services, including the near ubiquitous availability of Global Positioning System (GPS)-based devices and FCC requirements that Enhanced 911 capabilities be incorporated into cell phones. This has dramatically recast the location services market in ways the FCC could not have envisioned when crafting the M-LMS regulatory regime.

A 'Status Quo' Regulatory Regime Does Not Advance the Public Interest

FCC regulatory changes, changing market conditions and technological advances in interference mitigation demand parity for M-LMS licenses in line with the kinds of reasonably crafted flexibility changes that have balanced the needs of licensed and unlicensed users in many other bands. Still, numerous first-round comments advanced a "just say no" approach in this band, opposing any rule changes that would facilitate viable M-LMS applications. Progeny LMS, LLC ("Progeny") maintains that eliminating

unnecessary and uneconomical service restrictions will maintain full commercial viability for existing Part 15 devices while providing the Commission with an opportunity to provide incentives for more efficient spectrum use for new systems. In a previously submitted white paper and in these comments, Progeny demonstrates that an M-LMS system operating at 30 Watts effective radiated power (ERP) would cause *less* interference to Part 15 devices than other Part 15 devices themselves. Progeny also contends that eliminating the bright line of M-LMS spectrum aggregation limits will improve, rather than hamper, interference mitigation efforts in this band.

Unfortunately, some commenters rely on scare tactics and protectionist rhetoric, rather than technical data, in an effort to build a case for maintaining the status quo for unlicensed Part 15 devices in this band, urging an outright rejection of sharing opportunities rather than embracing advanced technologies and cooperative efforts to mitigate interference risks. This approach is unrealistic at best. The Commission has made clear that it does not intend to pursue an approach of advancing the rights of *either* unlicensed systems *or* licensed operators in this or any other bands. Instead, the NPRM itself asks “how to maintain, and clarify or augment if necessary, the ability of M-LMS licensees and operators of Part 15 devices to coexist in the M-LMS Band.”

Enhanced Sharing Between Licensed, Unlicensed Users Is Viable

The hierarchy of shared use in this band by both federal and non-federal users, which Progeny does not seek to alter, represents a complex but highly manageable sharing environment. State-of-the-art radio equipment that harnesses technological advancements in power control, interference avoidance, spread spectrum techniques, mesh networking architectures and smart antennas increase predictability for existing Part 15 users in the band and further diminish new interference risks. Nonetheless, some commenters depict a misleading scenario of interference risk in this band by attempting to show that certain low power Part 15 devices would be overpowered by M-LMS systems permitted to operate under flexible measures and lower power levels than currently authorized (10 Watts EIRP). Unlicensed devices without digital modulation operate under Section 15.249 rules, which allow 0.7 mW EIRP of transmit power, and Part 15 devices with digital modulation operate under Section 15.247 rules, which allow emissions of 4 Watts EIRP. Thus, the power level of Section 15.247 devices is 5,714 times greater than Section 15.249 devices, yet *both* types of Part 15 devices successfully co-exist in unlicensed spectrum at 900 MHz without being “swamped” by these higher power levels. Other operations in the band have even higher limits: Amateur radio operators can transmit at 1500 Watts. Nonetheless, Progeny has demonstrated that M-LMS systems can provide services at 30 Watts ERP with less potential for harmful interference than Part 15 devices may cause to each other today.

The lifting of outdated service restrictions is not only technically feasible from an interference protection standpoint, it is desirable to advance important public policy goals. Progeny, as previously stated, is exploring a business and technical case for an “Enhanced Position Location” (EPL) service, which remains true to the original location and monitoring intent of the M-LMS band and helps to meet existing and emerging homeland security requirements. At the same time, forward-looking flexibility changes will further facilitate synergistic applications between licensed and unlicensed users in the band, including Progeny’s exploration of the potential of developing a nationwide “overlay network” that would enhance such sharing and interoperability opportunities between licensees and Part 15 devices in the band.

Progeny remains committed to engaging with stakeholders in the band to facilitate such collaborative efforts, including through trial opportunities to illustrate the real-world potential for sharing at 902-928 MHz. Progeny lauds the Commission for issuing this NPRM, which takes an important step forward to promote efficient spectrum use in this band and viable licensed deployments in the public interest.

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Appendix A - Progeny’s Response To Miscellaneous Assertions and

Allegations

reiterates its support for the Commission’s goal to “promote licensee flexibility while protecting other users.”¹

¹ *Amendment of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Notice of Proposed Rulemaking, WT Docket 06-49, Rel. March 7, 2006 (NPRM), ¶ 18.

I. The Commission’s Record of Spectrum Flexibility Requires that M-LMS Rules Be Updated to Achieve Public Interest Goals

The Federal Communications Commission (“the FCC” or “the Commission”) initiated this proceeding in Wireless Telecommunications Docket No. 06-49 as part of a comprehensive re-examination of the Part 90 rules for M-LMS licenses, which have not been updated since 1995. Since then, important FCC policies have emerged that require revising the regulatory regime for these licenses:

- **Flexibility:** Flexibility for spectrum-dependent services has not been limited to unlicensed users but has been applied across most licensed bands, recognizing the public interest benefits that flow from both.
- **Sharing:** Spectrum sharing has evolved as established federal policy. The NPRM reinforces such objectives, citing the opportunity to “consider the spectrum access needs of multiple users and to evaluate any proposals that may improve access and use of the band by both M-LMS and Part 15 operations.”² Advances in technology also have improved interference mitigation techniques, further enabling effective sharing.
- **Markets:** The market for location-based services has undergone a transformation since the M-LMS rules were enacted, driven by vastly improved GPS capabilities and FCC requirements that Enhanced 911 functions be available on cell phones.

A. Opponents Offered No Compelling Arguments Against Flexible Use

The NPRM recognizes the Commission’s established policy and practice of implementing service-neutral regulations that rely on technologically-based means for interference mitigation, rather than

² NPRM ¶ 4.

command-and-control restrictions. Still, some commenters suggest that rather than continued co-existence, the FCC should abandon its commitment to the deployment of licensed M-LMS services and expand the rights of unlicensed Part 15 and other applications in this band.³ Pulling the plug on M-LMS would be neither desirable from a public policy perspective nor necessary from a technological point of view.⁴ Modifying M-LMS rules to promote flexibility will serve the public interest by enabling deployment of public safety and homeland security services in this band and facilitating an overlay network for users of unlicensed devices.⁵

This proceeding provides the Commission with a critical opportunity to meet 21st century objectives of spectrum management by improving the efficiency of spectrum use, increasing the effectiveness of sharing and ensuring realistic interference protection criteria.⁶ As several commenters point out, spectrum efficiency and effectiveness goals at 902-928 MHz are increasingly also tied to

³ New America Foundation, et al., *In the Matter of Amendments of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006 (*NAF Coalition comments*) (“If this *NPRM* serves to bring any public interest benefits, it will be in the form of improving unlicensed access to the band.”)

⁴ Progeny LMS, LLC, *In the Matter of Amendments of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006 (*Progeny Comments*).

⁵ *Id.* at 10.

⁶ *See* U.S. DEPARTMENT OF COMMERCE, SPECTRUM POLICY FOR THE 21ST CENTURY – THE PRESIDENT'S SPECTRUM POLICY INITIATIVE: REPORT 1 (June 2004).

public safety objectives, facilitated by Part 15 devices and other systems that provide homeland security and critical infrastructure applications.⁷ The recent recommendations delivered by the Commission’s Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks underscored the importance of redundancy to both public safety and commercial networks. The report also stressed the importance of the Commission “working with NTIA and DHS to develop spectrum sharing among federal, state and local agencies for emergency response purposes.”⁸ As Progeny has indicated, the services that flexibility in this spectrum will allow to move forward, including Enhanced Position Location and overlay networking offerings, will offer important synergies between licensees’ capabilities and the innovative potential of Part 15 use.

The “just say no” approach embraced by some unlicensed wireless advocates is simply not a viable option for federal policymakers, who continue to identify sharing as critical for enhancing the best use of finite spectrum resources. This was most recently demonstrated in the FCC request for

⁷ See Wave Wireless, *In the matter of Amendments of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006 at 6. Wave Wireless noted that Part 15 devices in the band are “used for automatic meter reading, inventory control, package tracking and shipping control, alarm services, local area networks, and cordless telephones, and increasingly, various Homeland security applications.”

⁸ See Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, Report and Recommendations to the Federal Communications Commission, rel. June 12, 2006.

comments regarding the spectrum-sharing test-bed that is a recommendation of the President's Spectrum Initiative.⁹

Some arguments rely on naked assertions about interference risks – rather than technical data – to urge a blanket rejection of sharing opportunities. However, this is not responsive to the questions raised in the NPRM. More troublingly, some commenters merely urge the retention of unnecessary and uneconomical service rules for M-LMS licenses, hoping to maintain this band as a regulatory backwater in the interest of isolating unlicensed users from having to share with licensed “neighbors” in this spectrum. The excellent propagation characteristics of 902-928 MHz, and the public benefits that accompany additional consumer and public safety applications in this band, are too valuable to let outmoded regulations provide disincentives for efficient operations. Nonetheless, the NAF Coalition incorrectly contended that the FCC’s “choice is either to continue to pursue the failed command and control M-LMS allocation in the M-LMS band, or abandon it for the type of unlicensed service that the FCC’s Spectrum Policy Task Force lauded as an alternative to command and control regulation.”¹⁰

⁹ *See* Federal Communications Commission Seeks Public Comment on Creation of a Spectrum Sharing Innovation Test-Bed, *Public Notice*, ET Docket 06-89, Rel. June 8, 2006. The Notice stated that the FCC and NTIA are seeking to assess “innovative methods for spectrum sharing among disparate users to more intensive use of the finite radio spectrum.”

¹⁰ *NAF Coalition Comments* at 32.

Instead, the NPRM asks “how to maintain, and clarify or augment if necessary, the ability of M-LMS licensees and operators of Part 15 devices to coexist in the M-LMS Band.” Thus, commenters who suggested that the FCC faces a choice between an unworkable status quo and the continued success of Part 15 devices in this band present a false dichotomy.

B. The Commission Must Make Flexibility Decisions Based on Facts, Not Rhetoric that Opposes Sharing

Comments filed in this proceeding largely fall into three categories: 1) Support for spectrum flexibility, 2) Unilateral opposition to any M-LMS rule changes that would establish a balance between licensed and unlicensed users or motivate all users of the band to adopt spectrum-efficient technologies, and 3) Specific concerns that rule changes for M-LMS licenses not lead to harmful interference to other users.

The hierarchy of shared use in this band by a mixture of federal and non-federal licensed services, amateur radio operators and Part 15 devices creates a challenging – but highly manageable – scenario for providing flexibility for M-LMS licensees while ensuring continued access for other users.

The persistent challenge of maximizing the efficient use of spectrum through sharing opportunities is an unavoidable public policy question that is not unique to this spectrum and will not go away anytime soon in this and

other bands.¹¹ In proceedings involving complex spectrum sharing considerations, the Commission has wisely crafted flexibility solutions that maximize accessibility for multiple user groups that provide important consumer and public safety benefits.¹² Technological solutions for mitigating interference, such as those put forth by Progeny, let policymakers equitably balance the needs of competing users and minimize the risk of harmful interference.

Numerous commenters failed to respond directly to the Commission's technical questions. Several comments warned of the potential for interference stemming from flexibility for M-LMS licenses without offering

¹¹ The Commission has considered increased flexibility for unlicensed users operating in licensed spectrum, in addition to the instant question of licensed and unlicensed operators sharing the same band. *See* Unlicensed Operation in the TV Broadcast Bands, Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, *Notice of Proposed Rulemaking*, ET Dockets 04-186, 02-380, Rel. May 25, 2004 (*White Spaces NPRM*). The NPRM concluded: “[I]t appears that there are technical options now available that make it feasible for new types of unlicensed equipment to share spectrum in the TV bands without causing harmful interference to TV broadcast or other licensed services operating within these bands.”

¹² *See* Revision of Parts 2 and 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, *Report and Order*, ET Docket 03-122, rel. November 18, 2003 (*5 GHz Order*). The Order modified Part 15 rules to make an additional 255 megahertz of spectrum available in the 5.470–5.725 GHz band for unlicensed devices, while requiring interference mitigation measures such as Dynamic Frequency Sharing to protect operations such as military radars. “In addition to making more spectrum available for use by U-NII devices, we are taking steps to minimize the potential for these devices to cause interference to existing operations.”

solutions for how best to achieve effective sharing in this band. The NAF Coalition urged the FCC to end the M-LMS “saga” and instead expand unlicensed user rights at 902-928 MHz by allowing increased power levels for Part 15 devices in rural areas and lifting restrictions on outdoor unlicensed use in the band. However, the FCC states clearly in the NPRM that “modifications to Part 15 rules are beyond the scope of this proceeding.”¹³ Despite NAF’s unsubstantiated recommendation for terminating M-LMS services, the FCC has cited the public interest in maintaining M-LMS as a licensed service, even though service rules have not facilitated the introduction of new licensed services in this band because of a lack of viable equipment.¹⁴ The service flexibility measures contemplated by the NPRM also are fully in line with the requirements of Section 303(y) of the Communications Act.¹⁵

¹³ *NPRM* at 2, n1.

¹⁴ *See* In the Matter of Request of Warren C. Havens for Waiver of the Five-Year Construction Requirement for His Multilateration Location and Monitoring Service Economic Area Licenses, *Memorandum Opinion and Order*, 19 FCC Rcd 23742 (WTB MD 2004). The FCC Wireless Telecommunications Bureau concluded: “Notwithstanding the availability of telematics, we find that there is an important public interest benefit in ensuring the utilization of M-LMS spectrum and promoting a variety of services to the public.”

¹⁵ 47 U.S.C. § 303(y) (2006). This provision authorizes the FCC to provide flexibility for spectrum use if it is consistent with international agreements to which the United States is a party and if the FCC finds, after notice and opportunity for comment, that: (A) such an allocation would be in the public interest; (B) such use would not deter investment in communications services

Numerous comments opposed rule changes to the extent they would increase the potential for interference into Part 15 devices.¹⁶ These included requests that the Commission not lift M-LMS safe harbor provisions.¹⁷ However, Progeny puts forth a solution that would maintain certainty for existing Part 15 devices while promoting the utilization of spectrally efficient technologies by new systems. Progeny asks that the Commission modify the safe harbor so that it applies only to existing Part 15 applications that are now operating in the band while not indefinitely extending that indemnity from regulatory mitigation obligations to future unlicensed applications.

Other comments called for the FCC to resist changes that would increase the power, power spectral density or duty cycle of M-LMS devices to a scale that would create harmful interference to Part 15 devices and to not alter the requirement for field testing of M-LMS devices. However, in a white paper submitted pursuant to its 2002 rulemaking petition, Progeny had shown that an M-LMS system operating at 30 Watts ERP would cause *less*

and systems, or technology development; and (C) such use would not result in harmful interference among users.

¹⁶ See Part 15 Coalition, *In the matter of Amendments of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006 (*Part 15 Coalition Comments*).

¹⁷ See Motorola, Inc. *In the matter of Amendments of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006 (*Motorola Comments*).

interference to Part 15 devices than other Part 15 devices themselves.¹⁸ The white paper assumed that Progeny would deploy standard radio equipment. In the four years since the paper was published, the state of the art of radio equipment has improved dramatically, especially in areas such as power control, interference avoidance, spread spectrum techniques, mesh networking and smart antennas. Progeny intends to deploy radio equipment utilizing capabilities such as these, and in fact its actual level of interference will be even less than the level predicted in the 2002 white paper. Progeny contends that M-LMS systems should be allowed to operate above the allowed 30 Watt ERP output power level under special circumstances, “using well-documented advanced engineering techniques.”¹⁹

Finally, some companies sought retention of M-LMS spectrum aggregation limits.²⁰ The Commission’s rules allow licensees to aggregate M-LMS spectrum in Blocks B and C, but not to include the 6 MHz in Block A,

¹⁸ See Progeny Comments at 25. “In particular, Progeny believes M-LMS licensees should be allowed an additional 5 dB in output power when using closed loop power control systems, and an additional variable allowance based on the use of sectorized antennas.”

¹⁹ *Part 15 Coalition Comments* at 2.

²⁰ See Itron, Inc., *In the matter of Amendments of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006.

within any given Economic Area (EA).²¹ These restrictions were designed to foster a proliferation of multiple M-LMS services.²² Unnecessarily restrictive service limits for licensees have meant that this abundance of competing services has not occurred.

²¹ 47 C.F.R. § 90.353(d), (f) (2006).

²² *LMS Report and Order*, 10 FCC Rcd at 4722-23 ¶ 48.

C. The Commission Should Focus on Technical Solutions that Facilitate Effective Spectrum Sharing, Provide Interference Protection

Progeny recognizes that Part 15 devices deserve reasonable interference protection and does not seek to alter the relationship among various federal and non-federal licensed services in the band. To this end, Progeny is willing to cooperate with other users of this spectrum regarding viable opportunities to ensure successful shared use of this spectrum, including the exchange of technical data when feasible. On a going forward basis, Progeny also remains committed to engaging with other stakeholders regarding trial opportunities to demonstrate the real-world potential for sharing in this band, including through the operation of an overlay network.²³

Commenters who broadly assert that *any* changes to M-LMS service rules would cause unacceptable levels of harmful interference to Part 15 devices should substitute technical information for scare tactics. The NPRM

²³ *Progeny Comments* at 10. “Progeny is investigating the potential of developing a nationwide ‘overlay network’ that would facilitate sharing between licensed operations and existing Part 15 devices in the band.” An advanced overlay network would allow Part 15 devices, including stand-alone “point solutions” or campus-area communications networks, to communicate with one another. This “overlay network would employ open interfaces and standardized communication protocols, including TCP/IP.”

seeks a record that will facilitate public policy decisions for this spectrum based on technical information. The Commission noted that parties who favor retention of the testing requirement should explain why it remains necessary and how it could be defined so “that M-LMS licensees could readily assess whether they would cause unacceptable levels of interference to Part 15 devices.”²⁴ Yet most commenters simply stated that the interference-testing requirement should remain intact without recommendations for how to define it.

D. Progeny Seeks a Proactive Solution that Addresses Interference Concerns and Facilitates Service Deployments in the Public Interest

Progeny’s technical analysis, submitted during the initial comment period for the NPRM, answers each of these interference concerns and demonstrates that an M-LMS system operating at 30 Watts ERP (effective radiated power) using advanced technology promotes better and more efficient uses of the band, while causing no more interference by M-LMS licensees than unlicensed Part 15 users may cause to other Part 15 users in the band.²⁵ Thus, Progeny requests that the Commission eliminate unnecessary service restrictions, including limits on the type and content of messages, requirements for primary license use for vehicle location services,

²⁴ *NPRM* ¶ 41.

²⁵ *Progeny Comments* at 20.

and the restriction against real-time interconnection with the public switched telephone network (PSTN).

The Commission should maintain the current power levels, as Progeny has shown that a reduction in power would not decrease interference. In fact, reductions in the overall radiated power limits for M-LMS operations would potentially increase interference through the addition of more transmitter sites and decrease the economic viability of implementing a system.²⁶

Progeny also requests that the testing condition be replaced with technical specifications under which these licenses would operate. Establishing a specific set of technical requirements would accomplish the same interference protection purposes of the original test requirement and provide a reciprocal safe harbor to licensees in the band. Further, the current protections of Part 15 licensees from liability for harmful interference should not be extended, as these rules provide a perverse incentive to operate inefficiently in the band. Finally, the Commission should eliminate the bright line of spectrum aggregation limits that no longer act to serve any necessary measures for maintaining competition.

II. No Technical Reason Exists For the FCC to Preserve Outdated Service Restrictions on M-LMS Licensees

²⁶ *Id.* at 24.

The Commission has applied reasonable, carefully crafted flexibility measures in recent spectrum proceedings by relying on technologically based interference mitigation techniques to usher in new applications while at the same time protecting existing users. The FCC’s authorization of ultra-wideband (UWB) operations on an unlicensed basis offers a recent case in point. The Commission noted in the UWB First Report and Order:

“Spectrum management is a complex subject and interference protection goals in general must consider both the benefits of authorizing new emitters as well as the interference risk to other systems.”²⁷

These flexibility principles also were affirmed in the FCC’s *5 GHz Report and Order*, which made an additional 255 MHz of spectrum available in the 5.470 GHz to 5.725 GHz band. The order noted this additional spectrum would give unlicensed devices and networks “more flexibility to avoid interference with other services sharing the existing U-NII bands, thereby improving the quality of service experienced by consumers.” To

²⁷ See Revision of Part 15 of the Commission’s Rules Regarding Ultra-wideband Transmission Systems, *First Report and Order*, 17 FCC Rcd 7435 (2002). The rules allow UWB operations on an unlicensed basis with the use of emission masks, directional antennas, out-of-band emission limits and other interference mitigation measures to protect other spectrum users, including GPS. The technical standards apply to UWB devices operating in shared or in non-government frequency bands. The *Order* made clear that technical considerations were the focus of changes that protected all users: “[S]ubstantial benefits could be outweighed if UWB devices were to cause interference to licensed services and other important radio operations. Our analysis of the record and the various technical studies submitted indicate that UWB devices can be permitted to operate on an unlicensed basis without causing harmful interference provided appropriate technical standards and operational restrictions are applied to their use.”

address potential interference from U-NII devices, the Commission adopted interference mitigation measures, including Dynamic Frequency Sharing (“DFS”), to protect incumbent operations such as military radars.

A. The Commission is Not Prohibited from Altering Rules that Apply to Existing Licensees and Can Do So to Promote the Public Interest

Several commenters even suggest that the M-LMS rules are working as is.²⁸ Clearly, for unlicensed device operators, the complex sharing hierarchy in this band is simplified by the omission of any new licensed M-LMS operations, which have not deployed any systems due to a lack of viable equipment. This is hardly a sign that the rules for shared spectrum use are working as intended. The NPRM itself cites the lack of effectiveness of the current M-LMS rules in promoting new licensed services: “While the unlicensed use of this band has successfully provided consumers with numerous spectrum-based products, the licensed plan for this band has not similarly led to the development of new services.”²⁹

1. The Repeal of Unnecessary Service Restrictions Will Not Endanger Other Licensed Uses or Unlicensed Users in the Band

²⁸ *Part 15 Coalition Comments* at 3: “These rules have worked as intended. Even after the nationwide licensing of M-LMS systems, Part 15 manufacturers and users continued their impressive growth in this band.”

²⁹ *NPRM* ¶ 17.

Some comments suggest that the regulatory regime forged by the FCC ten years ago when finalizing service rules for M-LMS operations still represents the *current* balance needed to “implement M-LMS systems, to minimize the risk of out-of-band interference and, at the same time, maintain the band for the use of others on a Part 15 basis.”³⁰ The missing element to this equation, of course, is the deployment of new M-LMS systems, which has not come to pass as envisioned in the original service rules.³¹ Motorola suggests “the proposed changes to these rules will upset this careful balance and will lead to interference to unlicensed operations in the 902-928 MHz band and may lead to interference to adjacent band licensed operations.” But the purported regulatory balance these rules strike already has been upset by

³⁰ *Motorola Comments* at 5.

³¹ Although this posture may not be intentionally disingenuous, it also ignores the major steps toward regulatory flexibility that the Commission has undertaken in the past ten years to enable the prolific growth in unlicensed bands. These include, but are not limited to, the following changes: By a Report and Order the Commission made spectrum available for use by unlicensed National Information Infrastructure (U-NII) devices, including Radio Local Area Networks (R-LANS), operating under Part 15 of the FCC's rules. *See Revision of Parts 2 and 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) devices in the 5 GHz band*, Report and Order, 18 FCC Rcd 24484 (2003); In September 1998, the Commission began proceedings to allow for Ultra-Wideband (UWB) radio systems on an unlicensed basis under Part 15 of its rules. *See Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems, Second Report And Order And Second Memorandum Opinion And Order*, 19 FCC Rcd 24558 (2004).

advances in wireless location technology, which has eliminated a market-based need for a vehicle-only service.³²

2. Changed Market Circumstances Compel the FCC to Strike a Workable Balance Among Users in this Spectrum Through Updated Rules

Two events in particular have changed the technological landscape and commercial viability for M-LMS service from the original Commission vision for these licenses of “automatic vehicle monitoring” services. Shortly after the FCC held the first auction of M-LMS licenses, President Clinton in 2000 turned off the intentional errors (i.e., “selective availability”) in the Global Positioning System (GPS).³³ For security reasons, the selective availability feature of GPS intentionally degraded the accuracy of the system for non-military use. This Presidential decree increased the accuracy of civilian devices ten-fold, to precision within 30 and 60 feet from a previous range of

³² While ARRL, the National Association for Amateur Radio, takes a position of “no change” in the band, it also notes in comments the extent to which growth in location information systems is centered on GPS. ARRL also notes: “Transmission of location information need not use the same system as used for location determination but can be integrated in, and incidental to, normal mobile-to-base radio communications and may be distributed throughout a network.” See ARRL, *In the matter of Amendments of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006 at 5.

³³ Office of the Press Secretary, *President Clinton: Improving the Civilian Global Positioning System (GPS)*, Press Release, rel. May 1, 2000.

300 feet.³⁴ The second critical driver that changed the market occurred in May 1999 when the FCC established requirements for commercial wireless carriers to have location capabilities built into subscribers' handsets.³⁵ The requirement serves to locate cellular subscribers in an emergency situation. Commercial wireless providers are using GPS, A-GPS, and other technologies such as radiolocation to satisfy the FCC's Enhanced 911 (E911) requirement.

Both factors have led to widespread ownership of GPS devices. The 2000 Presidential decree estimated over 4 million GPS users worldwide and a market of \$8 billion at that time. The E911 cellular carrier requirement has put GPS location technology in roughly 75 million phones in the United States, further increasing the number of GPS-enabled devices in the marketplace.³⁶ This market is still poised for growth. Sales of GPS-enabled

³⁴ Glenn Derene, *Great GPS Gadgets*, Forbes Magazine, May 16, 2006, available at http://www.forbes.com/forbeslife/2006/05/15/gps-gadgets-technology_cx_gd_0516feat_ls.html.

³⁵ FCC, "FCC Adopts Wireless 911 Rules: Rules Will Improve Accessibility of 911 Service for Wireless Users," *News Release*, Rel. May 13, 1999.

³⁶ GPS world estimates that currently 100 million GPS phones are on the market with 85% of those in the US alone. See Bryan Jenkins, Jonathan Styles "Galileo Market Context Update: Phones and Cars" GPS World (May 1, 2006). As stated in Progeny's comments to the NPRM, Qualcomm estimates that their chips are in 150 million mobile phones enabled with GPS technology. See QUALCOMM, *QUALCOMM Enables Widespread Deployment of Location Services for WCDMA (UMTS) Markets*, Press Release (February 9, 2006). <http://www.qualcomm.com/press/releases/press_list_2006.html>. Not all carriers use GPS or Qualcomm's solution to satisfy their e911 location requirement. Some carriers use radiolocation technology to triangulate a

phones worldwide are expected to reach 280 million annually by 2010 in the global market.³⁷ Another source estimates that by 2020, 2 billion GPS-enabled phones will be sold annually.³⁸ According to a 2003 estimate by ABI, a technology market research firm, the GPS market will be worth over \$22 billion by 2008.

Other technological advances have compromised the commercial viability of an M-LMS-only service. Radiolocation in cellular towers and Wi-Fi routers employs triangulation techniques, angle of arrival, time difference of arrival, and location signature fingerprinting that store and recall patterns that mobile phones are known to exhibit at different locations. These location technologies can be employed using existing cellular and Wi-Fi infrastructure to deploy location service. GPS service is also improving and becoming more accurate.³⁹ The launch of Galileo, the European Union's satellite positioning system, and the future launch of GPS Block III (the Air

subscriber's position. Thus, the number of location-enabled mobile phones overall is higher than the GPS World estimated 100 million or Qualcomm's estimated 150 million figures.

³⁷ Jenkins and Styles, *supra* note 36(1).

³⁸ GPS World projects annual sales of GPS-enabled phones to grow from 200,000 in 2006 to 2 billion by 2020. Lester Craft, "GPS Phones Will Boom, but Hurdles Loom" GPS World, Apr 1, 2006.

³⁹ "New, Improved GPS" GPS World, March 1, 2006. (The U.S. Air Force completed an upgrade that will improve accuracy of the system by 10-15 percent.)

Force's next generation of GPS), will increase the capabilities yet again of location services both domestically and worldwide.⁴⁰

Another M-LMS licensee, Telesaurus Holdings GB LLC ("Havens"), has aptly noted that GPS and radiolocation technologies cannot fully replace the entire scope originally intended for M-LMS service.⁴¹ However, Havens's deployment plans for M-LMS service are only under way in combination with other technologies in order to make it a viable M-LMS service. Progeny, as stated in the reply comments, is developing a business and technical case for a system called "Enhanced Position Location" (EPL).⁴² Progeny is not abandoning the original intent of the M-LMS band. Elimination of unnecessary service restrictions will remove a significant obstacle in the deployment of a commercially viable service that contains an advanced location and monitoring component.

3. Service Restrictions are Proxies for Interference Mitigation Techniques, Which Can Be More Effectively Implemented Through Technical Rules

⁴⁰ Derene, *supra* note 34.

⁴¹ See Telesaurus Holdings GB LLC, *In the matter of Amendments of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Amended Comments, WT Docket 06-49, filed June 2, 2006 (*Havens Comments*) at 8 fn 5.

⁴² *Progeny Comments* at 8.

Unfortunately, many commenters who take a stance of “no change” incorrectly view overly restrictive service rules in this band as an end in themselves regarding interference protection. Thus, any prospect of change occasions a fear – without foundation – that eliminating these unnecessary service limits will lead to a loss of interference protection for unlicensed users. These comments neglect to consider that the current state of technology would ensure that at currently allowed power limits of 30 Watts ERP, M-LMS systems would not create a potential for interference to unlicensed users that is any greater than Part 15 devices already pose to each other in this band.

B. Calls for Reclaiming M-LMS Licenses are Thinly Veiled Attempts to Eradicate Commercial Licensed Uses from 902-928 MHz

Contentions by the NAF Coalition that the Commission reclaim all M-LMS licenses and “consider proposals to enhance shared use of the band by those who have used it most effectively and intensively – the Part 15 unlicensed operators” are deeply flawed.⁴³ The NAF Coalition asserts that such an extreme step would “send a clear message to all users of spectrum, both licensed and unlicensed” that the FCC rewards efficient spectrum use.

First, the Commission, through a long line of proceedings promoting spectrum flexibility and shared use, already has sent a message about the

⁴³ *NAF Comments* at 3.

need for sharing. The NAF Coalition’s argument that the Commission must reinforce this principle of efficient spectrum use through punitive measures – unfounded in the Commission’s regulations or on the basis of its public interest obligations – is merely frivolous. Through a long line of recent spectrum policy proceedings, including the *5 GHz Order* and the *White Spaces NPRM*, the Commission has sought to motivate efficient spectrum use through improved sharing opportunities between licensed and unlicensed users. The NAF Coalition also incorrectly invokes the spirit and the letter of the Commission’s Spectrum Policy Task Force findings.⁴⁴ Nowhere in the Task Force report’s principles, or in subsequent FCC proceedings that have embraced this approach, has the Commission pursued the path suggested by NAF of granting unlimited flexibility for unlicensed users at the expense of licensed applications. The Task Force recommended that FCC policy incorporate “maximum feasible flexibility of spectrum use by both licensed and unlicensed users.”⁴⁵

⁴⁴ *Id.* at 3. The NAF Coalition suggests that the Commission has “completely abandoned the comprehensive, forward-looking approach painstakingly arrived at by the Spectrum Policy Task Force.”

⁴⁵ FEDERAL COMMUNICATIONS COMMISSION, SPECTRUM POLICY TASK FORCE REPORT 3 (November 2002) (Filed under ET Docket No. 02-135). The report defines flexibility as “granting both licensed users and unlicensed device operators the maximum possible autonomy to determine the highest valued use of their spectrum, subject only to those rules that are necessary to afford reasonable opportunities for access by other spectrum users and to prevent or limit interference among multiple spectrum uses.”

Secondly, there are real-world reasons for keeping a licensed component viable as part of a spectrum-sharing equation. These include the ability of licensed bands to provide a secure backhaul for security-related unlicensed applications and to provide reliable quality of service for public safety users due to the predictability of interference avoidance. A valuable example of such convergence is Progeny's exploration of the potential of developing a nationwide "overlay network" that would improve sharing opportunities between licensed operations and existing Part 15 devices in the band.⁴⁶

Third, the FCC already has granted an extension of the required construction periods for three M-LMS licensees to enable the deployment of valuable services to the public.⁴⁷ In granting this necessary relief, the

⁴⁶ The need for improved access to licensed spectrum for backhaul has been recognized by others. *See* IEEE 802.18, *Wireless Broadband Access Task Force Seeks Comments on Issues Related to Commission's Wireless Broadband Policies*, Comments, GN 04-163 (2004). "As spectrum becomes more crowded – choices are made to use licensed spectrum for point to point and backhaul as alternatives to unlicensed spectrum where interference must be accepted. However, more widespread adoption of wireless access technology has been hampered by a lack of affordable backhaul particularly in rural areas."

⁴⁷ *See* In the Matter of Request of Warren C. Havens for Waiver of the Five-Year Construction Requirement for his Multilateration Location and Monitoring Service Economic Area Licenses, *Memorandum Opinion and Order*, 19 FCC Rcd 23742 (WTB MD 2004) (*Havens M-LMS Order*). Request for Extension of Five-Year Construction Requirement Call Signs: WPOJ871, WPOJ872, WPOJ873, WPOJ874 and WPOJ875, *Letter*, 20 FCC Rcd 4293 (WTB MD 2005) (*FCR M-LMS Letter*), *petition for reconsideration pending*. Request of Progeny LMS, LLC for a Three-Year Extension of the Five-Year

Commission has portrayed a far different picture of M-LMS efforts to build out this licensed spectrum than the “speculators and scofflaws” characterization misused by the NAF Coalition. For example, in granting to Progeny an additional three years to complete its initial buildout requirements, the Commission’s Wireless Telecommunications Bureau noted: “The record, moreover, demonstrates that Progeny sought to develop equipment and applications for its M-LMS spectrum but, like Mr. Havens and FCR, has been unsuccessful.”⁴⁸

Finally, flexibility changes that would enable geographic-based M-LMS licensees to deploy viable systems need not hamper those few grandfathered, site-based M-LMS services that are providing service in this band. Teletrac, for example, asks the Commission that whatever changes are made to M-LMS rules on a going-forward basis, existing, site-based licenses should “continue to be governed by present rules, including existing service restrictions, unless and until a licensee elects by written filing to the Commission to be subject to any new regulatory regime that the Commission may adopt in this proceeding.”⁴⁹ Progeny agrees that it would be in the public interest to not disrupt grandfathered

Construction Requirement for its Multilateration Location and Monitoring Services Economic Area Licenses, *Memorandum Opinion and Order*, DA 06-1094, rel. May 24, 2006. (*Progeny Order*).

⁴⁸ *Progeny Order* ¶ 16. The Order concluded that it served the public interest to grant Progeny additional time to meet this requirement.

⁴⁹ See Teletrac, Inc., *In the matter of Amendments of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006 at 2.

services, which, as Teletrac points out, have not received a “single documented complaint of interference” to a Part 15 device or licensed system in the past ten years.⁵⁰

1. Some Commenters Are Inconsistent in Calls for Spectrum Flexibility, Offering Support Only for Unlicensed Applications

The NAF Coalition states that granting M-LMS licensees “even a fraction of the spectrum flexibility they desire will do great harm to the future of unlicensed services in this band.” Progeny has clearly shown that the types of flexibility measures under consideration, such as the elimination of spectrum aggregation limits, would enhance rather than imperil interference protection levels for incumbents in this band. The NAF Coalition’s arguments are at odds with positions that NAF has taken in unlicensed flexibility proceedings, in which it has rejected such “worst-case scenario” thinking:

The Commission has long recognized that complete protection from the risk of any interference is as unrealistic as creating a speed limit low enough to avoid all automobile accidents. Had this been the requirement to deploy automobiles, the United States would have remained a horse and buggy economy rather than a world leader in the auto industry. Similarly, if any potential increase in interference risk prohibited creation of a new service or extension of Part 15, no new innovation could take place in wireless technologies.⁵¹

⁵⁰ *Id.* at 3.

⁵¹ See New America Foundation et al., *In the Matter of Unlicensed Operation in the TV Broadcast Bands, Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, Comments, ET Dockets 04-186, 02-380 (2004) at 26. “The Commission would do well to recall the principles it set forth when it created the current Part 15 rules... [T]he Commission explained that

the public interest demanded a balance between the risk of interference to licensed services and the tremendous potential to the public in expanded unlicensed access.”

C. Examples of Bands in Which the FCC Has Purportedly Retained Service Restrictions are Flawed

Some examples offered by commenters as ostensibly demonstrating the Commission's retention of service restrictions in other spectrum bands are simply not pertinent to the instant proceeding.

Havens argues that denying M-LMS service flexibility is consistent with other decisions in which the Commission has adopted specific use rules for licensees, such as the Air to Ground (ATG) Service, Wireless Medical Telemetry Service, Medical Implant Service, and the Low Power Radio Service.⁵² However, every service cited fails to support that contention. The main example, the ATG proceeding, is fundamentally different than the current M-LMS rulemaking.⁵³ Havens cited a Commission decision that ruled against a request to extend the new ATG rules to allow terrestrial service on a secondary basis in the ATG band. These new ATG rules gave licensees additional flexibility to offer any type of service (i.e., voice, data, broadband Internet) to serve any or all aviation markets (commercial,

⁵² *Havens Comments* at 37-40.

⁵³ *See* Amendment of Part 22 of the Commission's Rules To Benefit the Consumers of Air-Ground Telecommunications Services, *Order on Reconsideration and Report and Order*, 20 FCC Rcd 19663 (2005). Amendment of Part 22 of the Commission's Rules To Benefit the Consumers of Air-Ground Telecommunications Services, *Report and Order and Notice of Proposed Rulemaking*, 20 FCC Rcd 4403 (2004).

government, and general) using any present or future technology that can fit within the assigned spectrum block. Thus, the M-LMS restrictions that limit offerings to vehicle-only location services are far more restrictive than those present prior to the ATG order.⁵⁴

Why the Commission initiated the rulemaking in the ATG proceeding also presents sharp parallels that support the public interest reasons for providing flexibility to enable the deployment of viable new M-LMS services.⁵⁵ In December 2004, the Commission proposed the provision of 4 MHz in the 800 MHz band for new and innovative uses to serve the flying public. The ATG Notice of Proposed Rulemaking sought comments on whether the ATG rules were too restrictive as the original rules did not yield a competitive environment. Only one out of the six license holders was operating a commercial service. The Commission also noted the limited range only allowed narrowband voice and data services.

⁵⁴ The LMS service rules prohibit interconnection with the PSTN and contain an impossible to meet testing condition. The service is restricted to location monitoring for vehicles, a service that is no longer economically viable due to widespread adoption of GPS and E911. The ATG bandwidth limits only allowed telephony and limited data service. The Commission in the ATG rulemaking noted that only one out of 6 licensees was operational.

⁵⁵ See Amendment of Part 22 of the Commission's Rules to Benefit the Consumers of Air-Ground Telecommunications Services, *Notice of Proposed Rule Making*, 18 FCC Rcd 8380 ¶ 1 (2003) (*ATG NPRM*).

Havens also cites the Wireless Medical Telemetry Service, Medical Implant Service, and the Low Power Radio Service as services “designated for specific uses and in which the Commission has not provided licensees with the flexibility to provide other services.”⁵⁶ However, these services are all *unlicensed*.⁵⁷ The speciousness of this argument is apparent and should be wholly discarded.

D. The Commission Never Intended, and Unlicensed Device Operators and Manufacturers Cannot Expect, the M-LMS Band to Be Protected From New Licensed Uses

The comments indicate that M-LMS licensees, as well as many manufacturers of unlicensed equipment, intend to market valuable products and services, many of which will benefit public safety and rural users. But some opponents of eliminating outdated service restrictions and other unjustifiably burdensome regulations for M-LMS licenses urge the preservation of the 902-928 MHz band for unlicensed uses by barring any new applications – something the Commission has never intended.

The Consumer Electronics Association (CEA) asserts that unlicensed devices manufacturers, “and the millions of consumers and businesses that

⁵⁶ *Telesaurus Comments* at 40.

⁵⁷ With the exception of Low Power Radio Service for Automated Marine Telecommunications System (AMTS) purposes. *See* FCC Wireless Telecommunications Bureau Website, Section on Low Power Radio Service, available at http://wireless.fcc.gov/services/index.htm?job=service_home&id=low_power.

rely on such equipment, are entitled to expect that the products will not be subject to new interference.”⁵⁸ First, the Commission has stated previously that spectral environments that evolve over time in shared use bands do not provide “squatter’s rights” to unlicensed users beyond the protections of Commission regulations. For example, the Commission reiterated this message when issuing a Public Notice that cautioned consumers that they may experience new interference to garage door opener controls because the Department of Defense was making increased use of these frequencies to deploy new mobile radio systems for homeland security.⁵⁹ Garage door openers operated on these frequencies on an unlicensed basis under Part 15 but they had not received substantial government use for many years, meaning the risk of interference from this shared use was limited. While the Commission described various coordination efforts undertaken on a voluntary basis by the garage door opener manufacturers and DoD, the Notice stated: “As unlicensed devices, there is no right to protection from interference.”⁶⁰

⁵⁸ See Consumer Electronics Associations (CEA), *In the matter of Amendments of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands*, Comments, WT Docket 06-49, filed May 30, 2006 (*CEA Comments*) at 5. “The Commission should continue to limit the scope of M-LMS operations to vehicle location and other location-based services and continue to restrict M-LMS interconnection with the PSTN.”

⁵⁹ See Consumers May Experience Interference to Their Garage Door Opener Controls Near Military Bases, *Public Notice*, DA 05-424, Rel. Feb. 15, 2005.

⁶⁰ *Id.*

Second, Progeny agrees that existing users in the 902-928 MHz band warrant protection from harmful interference to the full extent provided under the Commission’s rules and as facilitated by advanced spectrum technologies that mitigate interference. However, neither the Part 15 rules nor the M-LMS service rules guarantee unfettered access for Part 15 devices over other users in the band. Providing flexibility to allow M-LMS services to flourish in this spectrum will promote the most technologically advanced, spectrally efficient equipment and techniques by all users of this spectrum.⁶¹ As the NPRM noted, spectrum is made available for Part 15 devices “on an unprotected and non-interference basis. Under Part 15, unlicensed devices may not cause harmful interference to M-LMS licensees, amateur operations, or other licensed systems in the 902-928 MHz band.”⁶² The NPRM stated that users of Part 15 devices “conforming to specified technical conditions under the safe harbor, however, are insulated from claims in the 902-928 MHz Band that such devices cause harmful interference to M-LMS systems.”

However, these provisions do not shield Part 15 operators from any and all “risks” of interference. The NPRM repeatedly cites a need to

⁶¹ *Progeny Comments* at 10. “The current service restrictions on M-LMS licensees provide no incentives for Part 15 manufacturers and users to deploy the most current, spectrally efficient technologies. Rather, there is a perverse incentive to rely on the continued imposition of antiquated service restrictions to artificially preserve spectrum “open space” for legacy technologies that employ large swathes of spectrum.”

⁶² *NPRM* ¶ 5, n 11.

minimize interference to unlicensed users, but it does not set a goal of eliminating all risks of interference in a complex spectral environment. The NPRM notes: “We seek to ensure that any changes would continue to protect federal and other licensed users and also avoid any *significant increase* in interference to unlicensed users in this band.”⁶³ (*emphasis added*)

Moreover, there are important public interest benefits to striking this balance between new applications and interference protection for the M-LMS spectrum. Progeny is actively engaged with business partners to develop an EPL service, for which a patent application has been filed, that will provide public safety and homeland defense applications.⁶⁴

III. Advanced Spectrum Technologies Obviate the Need for a Reduction in the Current Output Power Limits for M-LMS Systems

FCC policies allow spectrum-sharing on a basis that is a “two-way” street, rather than providing one-way protections for unlicensed users. The changes under consideration in the current proceeding would allow M-LMS licensees to deploy new services in this spectrum on a parallel footing to regulatory relief that unlicensed operators have received in many other bands.

⁶³ NPRM ¶ 1.

⁶⁴ *Progeny Comments* at 8. “This planned system will use technology, for which a patent application has been filed, to locate devices in areas where GPS service does not function adequately. Examples include providing service deep inside buildings or in subterranean areas, and at remote disaster scenes.”

A. Reducing the Output Power for M-LMS Systems Is Not Necessary to Mitigate Interference for Unlicensed and Other Users in This Band

The Commission has sought comment on whether M-LMS systems should be restricted to 6.1 Watts ERP total output power, and regarding defined limits on power spectral density (PSD). Currently, M-LMS systems are allowed to operate at an average output power of 30 Watts ERP (and at 300 Watts ERP in three narrowband channels) with no specified limits on PSD. As Progeny stated in its initial comments, while it agrees that PSD is an appropriate way to establish technical limits, PSD calculations need to be modified to reflect a correct comparison with Part 15 devices. In addition, Progeny is able to demonstrate that an M-LMS system operating at 30 Watts ERP will cause negligible interference to Part 15 devices operating in the 902-928 MHz band (including automatic meter reading devices). Progeny can demonstrate that reducing the allowed output power for M-LMS systems will have no effect on the geographic area of interference, since the reduction in power will result in a compensating increase in the number of transmitters covering the same geographic area.⁶⁵

⁶⁵ *Progeny Comments* at 19. “[T]he proposed reduction in output power for M-LMS systems will have no meaningful impact on the interference environment. Meanwhile, it will cause the cost of M-LMS systems to become uneconomical to deploy and operate, will hinder useful inter-operation among licensed and unlicensed users of the band, and, in short, will deny public safety and commercial users the opportunity to reap maximum benefits from this spectrum.”

Some commenters raise concerns that even a reduction of maximum M-LMS power to 6.1 Watts ERP would not effectively reduce interference risks to Part 15 devices, particularly devices that that operate below the lower maximum allowed output power. These comments further build a case for “no change.” However, as Progeny demonstrates, such arguments fail on both public policy and technological grounds. The Commission’s spectrum policy continues to evolve in an attempt to match current and emerging technological capabilities with the public interest benefits of ensuring that finite spectrum resources are utilized more efficiently and effectively. This is evidenced in recent regulatory modifications to reflect ongoing technical developments in cognitive radio technology.⁶⁶ The Commission stated in the *Cognitive Radio Order*, “Our goal is to ensure that our rules and policies do not inadvertently hinder development and deployment of such technologies, but instead enable a full market-based realization of their potential benefits.” In this Order, the Commission also noted its intention to revisit at a future date the ability of cognitive radio technologies to enable unlicensed devices to operate at higher power under certain circumstances.⁶⁷

⁶⁶ See Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies, *Report and Order*, 20 FCC Rcd 5486 (2005) (*Cognitive Radio Order*).

⁶⁷ *Id.* ¶ 22. The Order noted: “While we are not adopting any changes to allow higher power operation by unlicensed devices in this Report and Order, we continue to believe that cognitive radio technologies hold great promise to allow such higher power operation without interference to other spectrum

1. Several Commenters Raise Concerns About the Impact to Low Power Unlicensed Devices of Reduced Power Levels for M-LMS

CEA, Itron and the Telecommunications Industry Association (TIA) paint a seemingly disparate relationship between the M-LMS output power to Part 15 devices in an attempt to demonstrate the amount of interference that will result from M-LMS deployment.⁶⁸ These calculations only serve to present a misleading determination that M-LMS will overpower all Part 15 devices.

CEA states that Section 15.249(a) of the FCC's rules limit the field strength of unlicensed devices operating at 900 MHz to 50 mv/m at a distance of 3 meters, which CEA says amounts to approximately 0.7 mW of transmit power. CEA asserts that an M-LMS system operating at 6.1 Watts "could swamp these Part 15 devices with power levels almost 9,000 times greater, not merely 2.5 times greater as suggested in the NPRM."⁶⁹

As CEA correctly points out, unlicensed devices without digital modulation operate under Section 15.249 rules, which allow 0.7 mW of

users. We expect to further consider the issue of higher power unlicensed operation at a later date."

⁶⁸ See CEA Comments at 6. Itron Comments at 8. Telecommunications Industry Association, *Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Comment, WT Docket 06-49 (rel. 2006) (*TIA Comments*) at 8.

⁶⁹ *CEA Comments* at 6.

transmit power. However, CEA fails to explain that unlicensed devices with digital modulation operate under Section 15.247 rules, which allow emissions of 4 Watts. The power level of Section 15.247 devices is 5,714 times greater than Section 15.249 devices, yet both types of unlicensed devices co-exist today in unlicensed spectrum at 900 MHz. Other devices in the band have even higher limits: Amateur radio operators can transmit at 1500 Watts, which is 2,142,857 times greater. ISM devices have no practical power limit. Put another way, a Section 15.249 device is already designed to operate in the vicinity of many devices that can transmit at thousands of times its power.

Itron also cites the NPRM's request for comments on the potential reduction in the maximum equivalent isotropically radiated power (EIRP) in the three primary M-LMS band segments (904-909.75, 919.75-921.75 and 921.75-927.25 MHz) from 49.2 Watts EIRP to 10 Watts EIRP and the impact of reducing the maximum EIRP in the narrowband M-LMS segment (927.25 to 928 MHz) from 492 Watts to 16.4 Watts.⁷⁰ Itron suggests that the NPRM understates the impact of changes that would actually put M-LMS operations at 12.3 times, rather than 2.5 times, the power level of Part 15 devices, citing the tighter power limits for unlicensed devices authorized under Section 15.249, compared to the higher maximum power of Section 15.247. Thus,

⁷⁰ *See* Itron Comments at 8.

Itron concludes that an M-LMS station operating with 10 Watts EIRP would have “at least 6,000 times – rather than 2.5 times – the maximum power that is available to the Section 15.249 device.”⁷¹

However, as previously noted, Section 15.249 devices are already required to support interference from nearby devices with thousands of times their power output. Thus, M-LMS signals do not present an unusual exception to this case. Furthermore, most of Itron’s products are designed to transmit and receive between 910 and 920 MHz. This frequency range does not overlap with the M-LMS bands, except for a small 25 kHz slice at the upper end of the range. Thus, in terms of meter reading equipment, it is known that a substantial amount of such equipment utilizes frequencies that are 99.75 percent free from M-LMS systems. Such a frequency division is extremely effective at isolating signals from each system. Moreover, contentions that M-LMS flexibility changes would place undue burdens on consumers are entirely misplaced, given this virtual lack of spectral overlap.

Finally, TIA also raises concerns about the vulnerability of low power devices operating under Part 15.249 in the 902-929 MHz band, including cordless phones, meter reading equipment and stereo headphone systems. TIA suggests that even with 6.1 Watts ERP of allowed power for M-LMS systems, this would represent a power level at about four orders of

⁷¹ *Id.*

magnitude greater than what is allowed for unlicensed devices operating under Part 15.249.⁷² TIA notes that proposals to “relax the restrictions on M-LMS licensees would facilitate and encourage the deployment of high density, high traffic networks by today’s M-LMS operators. Such networks would necessarily increase the likelihood of harmful interference to unlicensed Part 15 devices in this band.” However, as Progeny has illustrated in these comments and previous filings, it is capable of providing services at 30 Watts ERP with less potential for harmful interference than Part 15 devices may cause to each other today.⁷³ In addition, the Section 15.249 devices to which TIA refers already are required to operate in environments in which multiple

⁷² See TIA Comments at 8.

⁷³ See Progeny Comments at 21. Indoor Part 15 devices can operate anywhere in the band and receive co-channel signals from an M-LMS system. These indoor devices are “insulated” by about 8 dB from co-channel interfering signals originating outdoors. Such devices may operate at up to 4 Watts equivalent isotropically radiated power (EIRP) (36 dBm), but in most cases only operate at 250 milliwatts EIRP (24 dBm) or less, enabling short-range communications within a home. When such Part 15 devices encounter interference, they may automatically boost output power or change an operating channel to improve the carrier-to-interference margin. Progeny evaluated the impact of a 30-Watt ERP M-LMS transmitter at three different heights (100, 150, and 200 feet) and across a range of distances from an indoor Part 15 device to assess the circumstances under which the Part 15 device would be unable to generate sufficient output power to overcome interference from the M-LMS transmitter. The evaluation assumed that the systems occupied similar bandwidths. Progeny demonstrated that *under no circumstances* does the Part 15 device receive interference requiring it to operate above a 250 milliwatt level. At no time does the Part 15 device need to operate at greater than 63 milliwatts (18 dBm) to maintain communication integrity.

15.247 devices are allowed to transmit at thousands of times the power of Part 15.249 devices. Thus, the M-LMS scenario is not significantly different.

2. Characterizations of the Vulnerability of Low Power Unlicensed Devices Fail to Account for the Operation of Other Part 15 Users at Higher Power Levels

Commenters are correct in noting that Part 15 devices are allowed to transmit at a maximum power of 4 Watts EIRP. The NPRM asks for comments on limiting M-LMS operations to 10 Watts EIRP, which would thus be 2.5 times higher than many unlicensed devices. The highest allowed power output under Part 15 is granted to devices that use frequency hopping or direct sequence spread spectrum under Part 15.247 of the Commission's rules. These devices are allowed a maximum output power of 1 Watt plus a 6 dBi antenna, which raises the actual allowed power to 4 Watts EIRP. As noted in the comments, other types of Part 15 devices include field disturbance sensors governed by Part 15.245 and non-frequency hopping systems authorized under Part 15.249. These devices do, in fact, have lower allowed output power because their energy is concentrated into a narrow bandwidth, instead of being distributed over a large bandwidth, as is the case for devices operating under Part 15.247. The narrow operating bandwidth of a Part 15.249 device gives rise to a high power per Hz in the occupied channel, which allows it to compete against higher power devices that spread

their energy over wider bandwidth, therefore reducing the power per Hz in the occupied channel.

Concerns raised about the vulnerability of such low power devices are not supported by the existing spectral environment at 902-928 MHz, in which low power unlicensed devices already must account for higher powered Part 15 devices in the band. First, commenters argue that highly sensitive Part 15 receivers, which are designed to pick up signals of the lowest powered Part 15 transmitters, will be “swamped” by M-LMS transmitters. However, these receivers already are compelled to operate in – and thus adapt to – an environment where other Part 15 devices transmit at 4 Watts EIRP. The fact that an M-LMS transmitter “is almost 9,000 times” more powerful than the weakest Part 15 transmitter is irrelevant. In fact, at 900 MHz, Free Space Propagation loss indicates that the power of the M-LMS transmitter will be reduced by a factor of *10,000* times at a distance of 8.5 feet from the transmitter.

An M-LMS transmitter operating at 10 Watts EIRP is still only 2.5 times more powerful than the transmitters these receivers are already designed to co-exist with. Of course, Progeny maintains that the present power limit of 30 Watts ERP is still entirely sustainable. As Progeny has demonstrated, state-of-the-art spectrum technologies will enable such interference to be negligible in the band.

From an engineering perspective, the alarmist claims employed by commenters who object to changes in the band are misleading and do not provide an accurate accounting of the changed spectral environment that will accompany flexibility changes for M-LMS licenses. In everyday life, power levels of radio systems vary according to the distance between the transmitter and receiver. These variations range across seven or eight orders of magnitude of power, meaning radio systems are designed to operate in environments where signals can be millions of times higher in certain locations based purely on the distance between the transmitter and receiver. The scale of these numbers is why the logarithmic dB scale is used for radio propagation. The use of the unconventional “9,000 times” by the commentators is merely a tactic to hide the truth of the matter, which is that the power of the M-LMS transmitter is reduced by 9,000 times at a distance of 7.7 feet from its antenna.

As Progeny has demonstrated, wide variations in the power levels of unlicensed radio systems, including Section 15.247 and Section 15.249 devices, already exist in this band and compel existing systems to adapt accordingly to this complex spectral environment. The Part 15 success stories cited by numerous commenters show that these devices are not only adapting, but are thriving in this environment. This further supports Progeny’s technical showing that with reasonable flexibility measures and

state-of-the art spectrum technologies, M-LMS systems will be able to operate in the band with negligible interference.

B. Preliminary Data Collection By Progeny Supports the Potential For Flexibility Measures in the Band to Not Increase the Risk of Harmful Interference

During the past month, Progeny undertook a measurement campaign around the Washington, D.C. metropolitan area. The purpose of the campaign was to characterize usage in the unlicensed 902-928 MHz band. Preliminary analysis of residential areas examined indicates that for many sites, this spectrum was either not heavily used at all, or in use by an AMR system in a part of the band for which M-LMS licensees are not allowed to operate, except for a small sliver of 25 kHz. A parallel examination of commercial areas indicated a range of spectral activity, although none of the results analyzed to date indicate that M-LMS systems would contribute more than incremental noise to these areas.

Measurements were made at 82 outdoor locations that were geographically distributed throughout the area. At each location, an Agilent E4402B spectrum analyzer was used to capture emissions in the unlicensed band for a pre-specified duration. The analyzer's span parameter was set such that the noise floor would be well below -100 dBm, allowing effective capture of a range of signals. To ensure consistency in all measurements, a software application running on a laptop PC managed the spectrum analyzer

through its GPIB interface. This software automatically tuned the analyzer, set its operating parameters, ran each test for the allotted duration, and recorded the results.

An antenna with a flat frequency response in the band was selected. The frequency response was confirmed by generating a test signal and comparing it to the capture performed by the system.

The decision to perform outdoor measurements instead of indoor measurements was primarily driven by logistics, inasmuch as given the short time available to make the measurements, it was easier to measure a large number of locations if the measurements were performed outdoors. Performing measurements indoors would have required coordinated building access in many locations, which was not feasible. In addition, outdoor performance represents a kind of “worst case scenario” for M-LMS systems in terms of interference to other users. M-LMS signals received outdoors do not benefit from the 6-18 dB of building attenuation that occurs when signals pass from outdoor environments to indoor environments. A Part 15 device located outdoors will receive more interference from M-LMS service than a Part 15 device located indoors. In this sense, characterizing outdoor unlicensed use is more representative than characterizing indoor use.

In most locations the spectrum analyzer spent either 15 or 25 minutes capturing measurements. Longer measurements (8-12 hours) were made in a

small number of locations. To reduce variability, all measurements were captured with the antenna in a fixed position relative to the environment (i.e., the antenna was never mobile during measurement capture).

1. Initial Observations Regarding Residential Data Point to Sparse Activity, With the Exception of an AMR System

In residential areas, usage tended to be sparse, except for one portion of the band: many measurements showed activity around the 913 to 918 MHz range, in which licensed M-LMS systems are not licensed to operate. Apart from this range, activity was spotty or non-existent.

This activity was so pervasive that further studies were performed to determine and characterize the source of the emissions. The source was determined to be the local electric utility's fixed-network AMR deployment, which utilizes Itron's 45-Series ERT[®] modules. The FCC Type Acceptance documentation for these units (FCC ID EO945ER-1) indicates they operate under Part 15.247 (not Part 15.249) rules and transmit in the 910-920 MHz range. According to Itron's product literature, the modules can be configured to transmit readings to a fixed network at 1.25, 2.5, or 5 minute intervals. This periodicity and frequency range were consistent with our observations. The units also can transmit in response to a query received in the 952 to 956 MHz range, such as might be sent when a meter-reading van drives by. Taken together, the transmissions from meters at multiple houses occupied slightly more than 5 MHz within the 910-920 MHz range. The edges of the range were not observed to be active.

It is important to note that M-LMS networks are not authorized under the Commission's rules to utilize this 910-920 MHz range, except for a 25 kHz slice at the upper end. There is 99.75 percent frequency separation between these two systems (the actual frequency separation is closer to 100%, as the AMR modules were not observed to use the last 25 kHz). Therefore, no interference should be expected between these systems. Any interference would be adjacent channel interference and, given the frequency separation, such interference will be further attenuated by many tens of dB.⁷⁴

2. Commercial Areas Examined Demonstrated a Broad Range of Spectrum Use, But Failed to Yield a Scenario that Would Point to M-LMS Interference

A number of different scenarios were observed in commercial and industrial areas. Several areas were spectrally "vacant" during our observation period. Other areas contained strong emissions that occupied the entire band. These emissions were not consistently observed during all time intervals; sometimes they were present, sometimes not. More investigation

⁷⁴ See Progeny Comments at 22. "Consider the case of Itron's AMR devices, which operate outdoors and transmit data to meter readers or nearby base stations at 915 ± 3 MHz. These devices operate well outside the licensed M-LMS band; their center frequency is 6 MHz from the closest edge of the M-LMS "A Block" and 4 MHz from the closest edge of the M-LMS "B Block." It is a standard engineering practice for radio receivers to be able to tolerate signals transmitting up to and beyond -28.8 dBm in *adjacent* channels. Using the parameters and conditions outlined in the white paper (suburban setting, COST-Walfisch-Ikagami propagation model, Decibel Products Wide Band Panel Antenna DB876G90A-XY), Progeny has determined that the M-LMS signal is far below the -28.8 dBm threshold for tolerable adjacent channel."

is necessary to characterize their source. However, by observing the strength of the signals when they were present and cross referencing the calculations performed in the M-LMS White Paper, it is believed that M-LMS systems would contribute only marginally incremental noise to these areas. To put it another way, if Part 15 systems successfully operate in the presence of these signals today, they should continue to operate in the presence of an M-LMS system.

C. Progeny Can Accept the Safe Harbor But Asks that the Commission Apply the Same Safe Harbor to M-LMS Operations

The NPRM solicited comment on the tentative conclusion to retain the “safe harbor”⁷⁵ for unlicensed users of Part 15 devices and licensed amateur operations. Numerous commenters expressed concern about any change in the safe harbor provision. For example, the Part 15 Coalition asserts that “any lessening of the protection provided by the safe harbor rule would disrupt existing operations and seriously threaten continued investment in and use of the unlicensed band.”⁷⁶ In general, several commenters have urged the retention of this rule based on the certainty that it provides Part 15 device manufacturers and users. In supporting the retention of this rule, CEA stated that the safe harbor provision was adopted after a lengthy

⁷⁵ 47 C.F.R. § 90.361 (2006).

⁷⁶ *See* Part 15 Coalition Comments at 5.

rulemaking proceeding as a “bright line standard to define what would not be considered harmful interference.”

Progeny appreciates the intent of the Commission to preserve balance and co-existence of multiple uses within the 902-928 MHz band. However, the safe harbor’s so-called “bright line” approach represents an outmoded regulatory way of thinking about interference protection that is not based on the current state of spectrum technology. In numerous, recent spectrum proceedings, the Commission has relied on technological advances for balancing interference mitigation and maximizing efficient spectrum use.

For example, the Commission adopted rules to foster the introduction of wireless broadband operations at 3650 to 3750 MHz.⁷⁷ The Order maintained primary allocations for Fixed Service and Mobile Service and retained a secondary Fixed Satellite Service allocation in the band, while providing flexibility for other new terrestrial uses. The FCC concluded the public interest would best be served by “establishing minimal regulatory barriers to encourage multiple entrants in the 3650 MHz band and to stimulate the rapid expansion of broadband services.”⁷⁸ At the same time,

⁷⁷ See *Wireless Operations in the 3650-3700 MHz Band, Rules for Wireless Broadband Services in the 3650-3700 MHz Band, Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, et al., Report and Order and Memorandum Opinion and Order*, ET Docket Nos. 04-151, 02-380, 98-237 and WT Docket No. 05-96, (2005) (*3650-3700 MHz Order*).

⁷⁸ *Id.* ¶ 15.

the rule changes were designed to protect incumbent grandfathered satellite earth stations and Federal Government radiolocation stations in this band from harmful interference.⁷⁹ Unlicensed devices were allowed to operate in this spectrum at higher levels than allowed under Part 15 rules with the caveat that contention-based protocols be used.⁸⁰

In light of the innovative flexibility measures that have been applied widely across other bands, the Commission should avoid preserving incentives for retaining inefficient spectrum usage in this band. Progeny asks the Commission to modify the safe harbor so that it applies only to existing Part 15 devices currently operating in the band. This should serve the dual purpose of providing certainty for existing unlicensed operators who have made substantial investments in the band while promoting efficient spectrum use among new users. The Commission should not extend the indemnity from regulatory mitigation obligations to future unlicensed uses or technologies in perpetuity.

⁷⁹ *Id.* ¶ 50. The Order adopted a peak power limit of 25 Watts per 25 MHz bandwidth for fixed stations.

⁸⁰ *Id.* ¶ 16. The Order stated that “such systems allow multiple users to share the same spectrum by defining the events that must occur when two or more devices attempt to simultaneously access the same channel and establishing rules by which each device is provided a reasonable opportunity to operate.”

Given that unlicensed Part 15 devices may not cause harmful interference to primary M-LMS operations, manufacturers of unlicensed devices should be given a clear understanding – and fair notice – that they will be expected to employ state-of-the-art radio technologies that will minimize the potential for harmful interference. The Section 90.361 provision, however well-intentioned, puts the interference avoidance burden where it does not belong – on the licensee. Unlicensed device manufacturers have readily committed to such technology advances, including DFS measures in the 5 GHz band, as part of flexible spectrum regulatory regimes that allow Part 15 devices to share spectrum with licensed users.⁸¹

D. Advanced Spectrum Technologies Have Enabled Unlicensed Devices to Deploy in Spectrum Where Interference to Existing Users Was a Critical Issue

Many proponents of licensed flexibility in this band do not refute, but simply ignore, the ability of advanced spectrum technologies to mitigate a risk of new interference to Part 15 devices that is any greater than these unlicensed operations already pose to each other in this band.

⁸¹ See Revision of Parts 2 and 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) devices in the 5 GHz band, *Order*, 21 FCC Rcd 1816 (2006). (Citing cooperation of unlicensed equipment industry with National Telecommunications and Information Administration (NTIA) to develop test procedures to ensure DFS adequately protects federal licensed users).

1. Motorola Has Urged the Consideration of Higher Power Levels for Broadband Systems Such as Canopy at 5 GHz

Motorola contends that even at the reduced power levels posed as possibilities in the NPRM, there would still be a risk to unlicensed devices resulting from the “deleterious effects of significantly increasing the density and operating characteristics of M-LMS systems.”⁸² Motorola has raised concerns about the impact of any M-LMS rule changes to its broadband Canopy radios, land mobile MOTotalk (Direct Talk) and DTR Series radios. In the case of Motorola’s Canopy system, it provides wireless broadband service in the 902-928 MHz bands with a line-of-sight range of more than 40 miles.⁸³

Motorola has taken a more generous stance toward recommended power limits for Canopy in other unlicensed bands. In responding to the Commission’s Notice of Proposed Rulemaking regarding increased flexibility for unlicensed devices in the 5 GHz band, Motorola noted the effectiveness of its Canopy system for providing higher power unlicensed operations in the high band of this spectrum at 5.725-5.825 GHz, which allows 4 Watts EIRP for point-to-multipoint applications and 200 Watts EIRP for point-to-point

⁸² See Motorola Comments at 6.

⁸³ *Id.* Motorola notes that the “reduced power levels contemplated by the Commission are not sufficient to overcome the deleterious effects of significantly increasing the density and operating characteristics of M-LMS systems.”

applications.⁸⁴ Motorola encouraged the FCC to “undertake further analysis in the near future with higher power systems to determine whether operations in excess of 1 Watt incorporating the new interference avoidance mechanisms being placed on the new U-NII band, such as DFS, allow for successful spectrum sharing.”⁸⁵ Clearly, Motorola aims to take a protectionist stance at 902-928 MHz for unlicensed operations such as Canopy, while at the same time raising the possibility of higher power levels for Canopy in other bands. Motorola is essentially seeking interference protections tantamount to a licensed service for its unlicensed operations at 902-928 MHz.

2. Itron Has Urged the Commission to Forego Flexibility Changes That Would Enable More Efficient Use of 902-928 MHz

Itron consistently has asked the Commission to forego technologies that would allow more efficient use of the 902-928 MHz band. In the Commission’s cognitive radio proceeding, Itron urged the FCC to “limit high-power cognitive radio operations to the 2.4 GHz and 5.8 GHz bands in order

⁸⁴ See Motorola, *Revision of Parts 2 and 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Comments, ET Docket No. 03-122 (2003) (*Motorola 5 GHz Comments*). The Commission instead decided to modify the Part 15 rules so that unlicensed U-NII devices operate at 1 Watt EIRP in the 5.470 to 5.725 GHz band. See *Revision of Parts 2 and 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, Report and Order*, ET Docket No. 03-122, 21 FCC Rcd 1816 (2003) ¶ 19.

⁸⁵ *Motorola 5 GHz Comments* at 4.

to preserve the 902-928 MHz band for low-power and low duty cycle unlicensed systems.” Alternatively, Itron asked that the Commission establish a duty cycle limit for cognitive radios operating in the 902-928 MHz band to protect “invisible” low-power, low duty cycle devices operating in the same band.⁸⁶

Similarly, Itron opposed potential changes to the Commission’s Part 2 and 15 Rules insofar as advanced antenna technologies would have been permitted for deployment within the 902-928 MHz band.⁸⁷ Again, Itron contended that the 902-928 MHz band was worthy of a more stringent level of protection from interference than unlicensed bands at 2.4 GHz and 5 GHz because of the tens of millions of low power unlicensed devices, including its automatic meter reading equipment. Itron told the Commission, “Many of the high power advanced technologies contemplated for operations in the 2.4 GHz and 5.7 GHz bands would pose a serious risk of harmful interference if permitted in the 902-928 MHz band.”⁸⁸ The Commission, however, stipulated that it was not persuaded by Itron that a new measurement procedure should

⁸⁶ See Itron, Inc., *In re Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies*, Comments, ET-Docket 03-108 (2003).

⁸⁷ Itron, Inc., *In the Matter of Modification of Parts 2 and 15 of the Commission’s Rules for Unlicensed Devices and Equipment Approval*, Reply Comments, ET Docket No. 03-201 (rel. February 9, 2004).

⁸⁸ *Id.* at 1-2.

not be applied to devices at 902-928 MHz because of the potential for harmful interference. The Commission instead decided to modify Section 15.247 to permit the determination of the output power of a digitally modulated system by the same methods used to determine the output power of systems operating pursuant to the U-NII rules, applying this procedure uniformly across the 915 MHz, 2.4 GHz and 5.7 GHz bands.

The Commission noted:

“We find that Itron has not made a significant showing to warrant exclusion of the 915 MHz band from the revised regulations. We continue to believe that these changes will benefit operators in the 915 MHz band equally as well as operators in the 2.4 GHz and 5.7 GHz bands without resulting in increased risk of interference.”

Collectively, Itron’s positions in such proceedings at the Commission attempt to protect its legacy technology at the expense of freezing technical innovation in and limiting the efficient use of the 902-928 MHz band.⁸⁹ Itron noted in comments on M-LMS flexibility that if “these higher powered M-LMS stations were permitted to transmit for any purpose, at any location, for

⁸⁹ See also Itron, *In the Matter of Modification of Parts 2 and 15 of the Commission’s Rules for Unlicensed Devices and Equipment Approval*, Comments to Petition of Reconsideration, ET Docket No. 03-201(rel. Dec. 6, 2004). (Supporting the position of Cellnet in petitioning the Commission to require duty cycle limits for newly certified devices using digital modulation techniques and to adopt spectrum etiquette rules in the 902-928MHz band). The Commission has not ruled on smart antenna changes, but has allowed cognitive radios to operate in unlicensed bands. See *Cognitive Radio Order* ¶ 39. Itron has also advocated the Commission’s position on allowing unlicensed wireless broadband providers operate in the unused portions of the television bands in order to further isolate who operates in the 902-928Mhz band. See Itron, Inc., *In the Matter of Unlicensed Operation in the TV Broadcast Bands*, Comments, ET Docket No. 04-186, rel. Nov. 30, 2004.

any length of time, with any number of units, there would be serious interference to Part 15 devices.” Itron’s position of “no change” regarding potential flexibility is consistent with its stance in other proceedings – and equally unwarranted – regarding protectionist measures for 900 MHz.

However, this posture of guarding 900 MHz devices from the positive repercussions and manageable risks of new advanced spectrum technologies in this band also fails to account for the extent to which the growth in Itron’s AMR devices is occurring *outside of* this spectrum. As Itron itself has noted, the Commission has taken several steps, starting in 2000, which further pave the way for automatic meter-reading devices to operate at 1427-1432 MHz, including an upgraded allocation for telemetry operations in the 1429.5-1432 MHz band from secondary to primary.⁹⁰ “As a result of these actions, Itron has developed a new generation of automatic meter reading systems that it is

⁹⁰ See Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service, ET Docket 99-255, PR Docket 92-235, *Report and Order*, FCC 00-211, 15 FCC Rcd 11,206 (2000). Itron also has noted that the FCC has allocated the 1427-1429.5 MHz band to the Wireless Medical Telemetry Service (“WMTS”) on a primary basis. It also created seven geographic carve-out areas for which, in order to accommodate existing services, the primary WMTS allocation is 1429-1431.5 MHz and the primary allocation for non-medical telemetry is 1427-1429 MHz and 1431.5/1432 MHz. The FCC adopted coordination procedures for 1427-1432 MHz and adopted service rules for medical and non-medical telemetry operations at 1427-1432 MHz. See *Amendments to Parts 1, 2, 27 and 90 of the Commission's Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, Report and Order, FCC 02-152, 17 FCC Rcd 9980 (May 24, 2002).

marketing to electric, gas, and water utility companies.”⁹¹ Itron told the Commission it anticipated that millions of its automatic meter reading systems would be deployed in a “relatively short period” in this spectrum and Itron’s devices will be “ubiquitous” in this band.

IV. Removal of Spectrum Aggregation Limits Will Not Increase Interference or Harm Competition in the M-LMS Band

The NPRM asks for comments “on whether eliminating the M-LMS aggregation limits has the potential to reduce interference to other users in the M-LMS band.”⁹² Progeny believes that removal of the M-LMS aggregation limits can allow for an M-LMS licensee to employ better interference avoidance techniques. The NPRM also questions whether the original purpose of the aggregation limits remain valid in the current competitive environment for telecommunication services.⁹³ Progeny continues to believe that the current competitive landscape has changed and removal of the aggregation limits is necessary to create the proper economic incentive to deploy M-LMS networks.

⁹¹ See Itron, Inc., *In the Matter of Preliminary Views on WRC-07 Issues*, Comments, DA 04-1698 (rel. June 14, 2004) at 3.

⁹² *NPRM* ¶ 35.

⁹³ *NPRM* ¶ 34.

A. Fewer Operators in Each Economic Area Will Translate Into a Lower Spectrum Use Footprint by Licensees

Several commenters raised concerns that a spectrum cap continues to be needed in the M-LMS band. Itron, for example, believes that keeping the 6 MHz in Block A decoupled from the 2.25 MHz in Block B and the 5.75 MHz in Block C will “provide incentives to use M-LMS spectrum more efficiently.” Itron also contends that a single M-LMS licensee who holds the entire M-LMS band in an EA would not employ “spectrum conserving measures that would optimize use of each MHz.”⁹⁴ However, Itron’s unnecessarily restrictive spectrum conservation view does not address the interference questions upon which the NPRM seeks comment.

In fact, removing the spectrum aggregation limits will potentially allow fewer operators in an EA to better employ interference avoidance techniques in a coordinated manner. These consolidated operators can spread their signal across a larger area of the band. Spreading the signal across a larger area will allow M-LMS licensees to reduce power spectral density, which will further minimize the amount of potentially increased interference risk to Part 15 devices. Itron’s comments, despite raising numerous concerns about potential interference to AMR devices, fail to provide reasons why the Commission should keep the aggregation limits based on interference mitigation risks.

⁹⁴ *Itron Comments* at 12.

The Commission also sought comment on whether removal of the aggregation limits would make access for unlicensed users more difficult.⁹⁵ TriSquare Communications contended that removal of the limits will reduce the effectiveness of their frequency hopping techniques.⁹⁶ In addition, the NAF Coalition cites a now defunct unlicensed user from a previous proceeding who believed that frequency hopping would become more difficult.⁹⁷ The NAF Coalition also refers to an unlicensed user who believed that channel avoidance will be more difficult to accomplish if an M-LMS user occupied the entire band.⁹⁸

First, the removal of the aggregation limits would still limit M-LMS licensees to 14 MHz in the 902-928 MHz band. These three unlicensed users can continue to operate across the entire 26 MHz. Progeny believes that operating over 14 MHz using the latest spectrum technologies can reduce interference and allow for coexistence between those that employ frequency

⁹⁵ *NPRM* ¶ 35.

⁹⁶ *See* Tri-Square Communications, Inc., *Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Comment, WT Docket 06-49 (rel. 2006) ¶ 34, 35 .

⁹⁷ *NAF Comments* at 18(quoting E-mail from Warren Havens to David Furth, February 3, 2003 at 16).

⁹⁸ *NAF Comments* at 18(quoting License Exempt Alliance, *In the Matter of Progeny LMS, LLC Amendment of Part 90 of the Commission's Rules Governing the Location and Monitoring Service to Provide Greater Flexibility*, Comments, RM-10403, filed May 15, 2002 at 4.

hopping. An aggregated M-LMS licensee can coordinate transmissions across the band to better manage interference risk to all types of users.

B. A Spectrum Cap is Not Needed to Preserve Competition in the Market for Location-Based Services

While the Commission sought comment on whether the competitive reasons for the M-LMS spectrum aggregation limits is necessary in the current marketplace,⁹⁹ the spectrum cap no longer serves its original purpose of promoting competition. As no M-LMS licensee who has won spectrum at auction has yet deployed service in this band, the competitive effects of the aggregation limits are neither ascertainable nor relevant. In other spectrum bands, the Commission has lifted spectrum aggregation limits.¹⁰⁰

The removal of the spectrum aggregation limits will help enable M-LMS licensees to deploy networks more cost effectively and competitively with other location service providers and licensed and unlicensed wireless operators. Removing these limits improves the competitiveness of M-LMS licensees in the overall wireless location services and advanced services market by removing an artificial and unnecessary disadvantage. The removal of these limits can reduce the complexity of the network

⁹⁹ *NPRM* ¶ 34.

¹⁰⁰ *In the Matter of 2000 Biennial Regulatory Review Spectrum Aggregation Limits For Commercial Mobile Radio Services*, Report and Order, 16 FCC Rcd 2763, 2764 ¶ 1 (2001) (*CMRS Spectrum Aggregation Order*).

environment in each market where consolidation occurs. These consolidated markets can compete more effectively by utilizing a coordinated network profile, with fewer towers and network equipment.

V. The Testing Condition Should Be Replaced By Technical Specifications That Put M-LMS Licensees on Equal Footing with Unlicensed Users

The NPRM solicits comments on whether the interference-testing requirement in Section 90.353(d) of its rules is still needed.¹⁰¹ Progeny reiterates its contention that the testing requirement should be eliminated, and replaced by provisions that provide actual incentives or regulatory requirements for parties to publish data on their technical specifications. The field-testing requirement is not only unnecessarily onerous for M-LMS licensees, it is virtually impossible to administer. Thus, M-LMS licensees are not realistically able to meet the field-testing obligation by the lack of clearly defined engineering standards for testing.¹⁰² For M-LMS licensees, this amounts to a regulatory Catch-22. The Commission expressed interest when

¹⁰¹ *NPRM* ¶ 39. See 47 C.F.R. § 90.353(d) (2006) (“EA multilateration LMS licenses will be conditioned upon the licensee's ability to demonstrate through actual field tests that their systems do not cause unacceptable levels of interference to 47 CFR part 15 devices”).

¹⁰² Progeny LMS, LLC, *In the Matter of Progeny LMS, LLC Amendment of Part 90 of the Commission's Rules Governing the Location and Monitoring Service to Provide Greater Flexibility*, Petition for Rulemaking, 27-28 (March 25, 2002) filed under RM No. 10403 (*Progeny Petition*).

enacting the original M-LMS rules in avoiding the unilateral establishment of a uniform testing methodology or standard, given the “varied technologies” in the band. These rules anticipated that M-LMS licensees and unlicensed users would collaborate regarding testing guidelines.¹⁰³ In ten years, that collaboration has not yet emerged, and does not appear imminent.

Several commenters have called on the Commission to retain this anachronistic regulatory requirement without addressing its ineffectiveness, despite the NPRM’s request for specific details. The Commission noted that M-LMS licensees are required to consider existing Part 15 devices when designing systems to minimize interference and asked whether this burden is warranted “given that users of Part 15 devices do not have priority over M-LMS operations and there is no database identifying the actual unlicensed users and operators?”¹⁰⁴

The NPRM also asks that commenters who favor retaining the testing requirement explain why it remains necessary and “how it could be defined so that M-LMS licensees could readily assess whether they would cause unacceptable levels of interference to Part 15 devices.”¹⁰⁵ Generally, commenters

¹⁰³ *NPRM* ¶ 39 (citing *Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, Order on Reconsideration, 11 FCC Rcd 16905, 16912 ¶ 16 (1996)).

¹⁰⁴ *NPRM* ¶ 41.

¹⁰⁵ *Id.*

were eager for the retention of this outmoded requirement, but remained silent on the second, critical part of the Commission’s question regarding how it could be made workable. The Part 15 Coalition merely asserts that the rulemaking “presents no reason to revisit the testing requirement, which is needed to ensure that interference is avoided not only in the artificial world of test labs but also in real world settings.”¹⁰⁶ Similarly, Itron urges the retention of the testing requirement, but does not stipulate how that can be done effectively.¹⁰⁷ CEA also recommends that the Commission keep this requirement by arguing that “given the paucity of operational M-LMS services” the Commission has not been able to fine tune its rules in the band based on “actual field data.” Such arguments are specious. The overly restrictive nature of these service and technical restrictions for M-LMS are the main reason why new licensees have not been able to deploy services in this spectrum. The dearth of M-LMS services to which CEA refers is an effect of the unnecessarily restrictive nature of the testing requirement, rather than a reason to keep it.¹⁰⁸

The absence of any viable solutions for how to implement such a flawed requirement further reinforces the need for the Commission to eliminate this provision, and instead rely on technical limits for minimizing interference. The current rules mandate that M-LMS licensees “prove a

¹⁰⁶ *Part 15 Coalition Comments* at 10.

¹⁰⁷ *Itron comments* at 13.

¹⁰⁸ *CEA comments* at 8.

negative.” Moreover, the rules are predicated on a collaborative effort involving both unlicensed providers and licensees in this band. Of course, the lack of collaboration to date is hardly surprising because the current rules provide no motivation for Part 15 users to come forward and produce technical requirements for interference mitigation. The lack of such meaningful information in the comments in this proceeding itself demonstrates the extent to which this provision lacks necessary incentives for such data to be presented by unlicensed wireless operators. As the questions raised by the FCC suggest, M-LMS licensees have no way to identify parties using Part 15 devices in any given area, much less the density or location of those systems. Without such usable data upon which to base field tests, M-LMS licensees are left with a perverse requirement to demonstrate they will not interfere with any potential Part 15 devices that may (or may not) be affected by their operations.

Moreover, the imposition of the test requirement exclusively upon M-LMS licensees also represents a peculiar aberration in the regulatory hierarchy in the band. Part 15 devices are required under Commission rules to accept interference from users higher in the band hierarchy, including M-LMS licensees. Placing the burden of preventing harmful interference only on M-LMS licensees and requiring them to prove they will not interfere with an unknown quantity of unlicensed devices *before* they can build out their

systems places unlicensed users in a superior position to licensees in a way not otherwise envisioned under the Part 15 Rules.

VI. Conclusion

Progeny urges the Commission to move forward in the public interest to undertake long-needed rule changes for M-LMS spectrum that protect existing unlicensed uses, including critical infrastructure applications that are important to advancing public safety and homeland security interests, and wireless applications that are promoting advanced services for consumers. There are not one, but many, stories of spectrum use in the public interest in this band, all of which would benefit from flexibility changes that motivate more efficient operations. Wave Wireless, for example, provides high-speed broadband wireless services to rural communities. Itron manufactures equipment that provides automatic meter reading devices to electric, gas and water utilities. And as the comments demonstrate, many other unlicensed applications have proliferated in this spectrum.

Nonetheless, none of the comments have presented any compelling reason for the Commission to thwart the potential for deploying advanced technologies and new services in the public interest, using M-LMS spectrum, under reasonably crafted flexibility changes that eliminate unnecessary service restrictions.

As the technical analysis and data collection conducted by Progeny demonstrate, the option of “no change” in this band would itself carry interference risks, given a spectral environment that already combines certain intensive unlicensed applications and legacy systems that have not been given incentives to use the most up-to-date interference mitigation measures. The NPRM notes that “no one technical rule can guard against all interference, whether or not it is classified as legally harmful.” Even in the face of this challenge, the Commission solicits “comment on how to maintain, and clarify or augment if necessary, the ability of M-LMS licensees and operators of Part 15 devices to coexist in the M-LMS Band.”

Progeny’s planned EPL and overlay networking offerings offer important public benefits, through homeland security and public safety applications.¹⁰⁹ To this end, Progeny urges the Commission to recognize that current spectrum policies that focus on critical objectives such as facilitating sharing and promoting efficient spectrum use require the elimination of unnecessarily restrictive and uneconomical service rules for M-LMS licensees.

Moreover, the increasing commercial demands for finite spectrum resources, combined with the continued need for spectrum for homeland security purposes, necessitate that the Commission facilitate opportunities for spectrum

¹⁰⁹ Importantly, both the EPL system and overlay network would address the types of redundancy issues raised to the FCC by the Independent Panel on Katrina, which cited a “failure of redundant pathways” for communications networks.

sharing among multiple users in this band who meet such growing needs. Wave Wireless notes the importance of the Commission considering “the critical balance that exists in the Part 15 environment with respect to interference. The variety of deployment of Part 15 devices here is the result of significant effort on the part of manufacturers to extract performance out of low cost effective technology in the presence of interference.¹¹⁰ However, many commenters suggest that rather than improved performance by unlicensed operators to prevent interference to their own devices, they would rather seek unlimited protection by the Commission in the form of outdated regulatory protections that shield Part 15 devices at the expense of M-LMS licensees’ deploying viable systems in this band.

What many commenters seek is the preservation of this unlicensed spectrum at 902-928 MHz for low power Part 15 devices at all costs. However, the safeguarding of this status quo to the benefit of systems that do not utilize advanced, efficient spectrum technologies comes at a heavy price. It takes away all regulatory incentives to operate with advanced interference avoidance techniques. Such recommendations turn a blind eye to technological advances that allow even low power systems to operate robustly in the face of a spectral environment that contains new M-LMS systems, which themselves would be equipped with more advanced capabilities for minimizing interference to other users. The Commission has previously

¹¹⁰ *Wave Wireless Comments* at 69.

declined requests to treat unlicensed spectrum at 902-928 MHz with far greater protections than unlicensed devices receive in other bands. These principles must also guide the outcome in this proceeding, by enabling effective spectrum sharing among multiple users, including viable M-LMS systems.

The apparent intent of many – although not all – commenters is to stonewall the Commission from initiating any flexibility changes in this band for M-LMS licensees to deploy usable services in the public interest.

Numerous unlicensed wireless advocates tout the substantial investments that manufacturers and users have made in this band and the uncertainty that any rule changes would create. This argument ignores, however, the extent to which Part 15 devices must operate beneath licensed users in the regulatory hierarchy that the Commission has implemented for this spectrum.

If the opportunity for meaningful spectrum sharing, rather than just one-way protections for Part 15 devices, is not advanced in the M-LMS band, the Commission will merely face these same challenges in other bands that must balance the rights of multiple users, including licensees and unlicensed devices. The very complexity of the spectral environment at 902-928 MHz is precisely what requires the Commission to address sharing challenges

regarding M-LMS flexibility and reasonable protection of existing Part 15 operations.

To advance the highest and best use of this band, rather than protecting inefficient systems to the detriment of deploying advanced new technologies, Progeny seeks to help build an ecosystem of innovation at 902-928 MHz that enables efficient spectrum use and effective spectrum sharing. Therefore, Progeny remains committed to continue working with the Commission and other stakeholders to develop a way forward based on sound technology that ensures that public interest-based applications for homeland security and consumers are deployed.

Respectfully,

/s/ Janice Obuchowski

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June 30, 2006

Appendix A

**PROGENY'S RESPONSE TO MISCELLANEOUS
ASSERTIONS AND ALLEGATIONS**

Progeny responds to various assertions made by filers during the comment period in this proceeding. As demonstrated below, the filer's comments contain many statements unsupported in fact or law.

A. Assertion: Progeny is the only M-LMS licensee advocating rule changes.

The Part 15 Coalition asserts that the Commission acted at the insistence of only one M-LMS licensee, Progeny.¹¹¹ Similarly, Cellnet Technology claims that Progeny is the only M-LMS licensee who advocates in favor of changes to the service rules for licensees in this band.¹¹² New America Foundation, et al ("NAF") and Warren C. Havens both single out Progeny as the driver behind these rule changes.¹¹³ While Progeny has been

¹¹¹ Part 15 Coalition, *Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Comments, WT Docket 06-49, rel. May 30, 2006 (*Part15 Coalition Comments*) at 3.

¹¹² Cellnet Technology, *Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Comments, WT Docket 06-49, rel. May 30, 2006 (*Cellnet Tech Comments*) at 2.

¹¹³ New America Foundation, et. al, *Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Comment, WT Docket 06-49, filed May 30, 2006 (*NAF Comments*) at 7. Telesaurus Holdings GB

instrumental in advocating for an equitable balance between licensed and unlicensed systems in the band, it is not the only M-LMS licensee that seeks flexibility in the rules. Helen Wong-Armijo and FCR, Inc. have submitted comments in this proceeding in favor of additional flexibility.¹¹⁴ The Alarm Industry Communications Committee (“AICC”), a non M-LMS licensee, did not oppose removal of the M-LMS aggregation cap, removal of the restriction on real-time interconnection with the Public Switched Telephone Network or service flexibility for M-LMS licensees.¹¹⁵ The AICC is only concerned with regard to doing no harm to existing Part 15 users. Other users have expressed similar sentiments. Most importantly, the Commission via this NPRM has determined that flexibility should be examined to produce more efficient and effective uses of the band.¹¹⁶

B. Assertion: Progeny Seeks to Remove Part 15 Users from this Band

LLC, Amendment of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands, Amended Comments, WT Docket 06-49, filed June 2, 2006 (*Havens Comments*).

¹¹⁴ Helen Wong-Armijo, *Amendment of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Comment, WT Docket 06-49 (rel. 2006). FCR Inc., *Amendment of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Comments, WT Docket 06-49 (rel. 2006).

¹¹⁵ American Alarm Communications Committee, *Amendment of the Commission’s Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands*, Comment, WT Docket 06-49 (rel. 2006).

¹¹⁶ *NPRM* ¶ 1.

NAF alleges that Progeny seeks to remove Part 15 users from the band.¹¹⁷ The logical deficiencies in this argument are evident from NAF's filing, the text of the NPRM, and Progeny's repeated support for the continuing operation of Part 15 devices in this band. NAF tenuously links Warren Havens' vision for the band with Progeny. Prior to making this leap in logic, NAF details Havens' opposition to Progeny regarding the M-LMS spectrum.¹¹⁸ Yet, NAF still concludes that Progeny shares Havens' vision. A quick review of the history between Havens and Progeny in the proceedings related to this band would give any rational observer pause to associate the two.

A plain reading of the NPRM points to the Commission's commitment to the continuing operation of Part 15 devices in the band.¹¹⁹ Progeny has never expressed a desire, nor do its long-term plans anticipate, that Part 15 will no longer operate in the 900 MHz band. Progeny's own comments in this proceeding discuss technologies that will enhance the capabilities of Part 15 devices in this band.¹²⁰ NAF's attempt to link Progeny to a party that has been extremely adversarial to it in almost every action it has undertaken is

¹¹⁷ *NAF Comments* at 16.

¹¹⁸ *NAF comments* at 15.

¹¹⁹ *NPRM* ¶ 37.

¹²⁰ Progeny is exploring the creation of a Part 15 overlay interoperable network that can provide more spectrally efficient uses for Part 15 devices operating in the band.

patently absurd. Progeny is committed to coexistence with Part 15 users in the band.

C. Assertion: The Current Rules Strike the Appropriate Balance Between Part 15 Devices and M-LMS Licensees

Several commenters repeat the mantra that the current rules strike the right balance between Part 15 and M-LMS licensees.¹²¹ This self-serving view completely disregards the FCC's sound bases for initiating this rulemaking proceeding in the first place. The NPRM seeks to provide a better balance that will produce more efficient and effective use of the band.¹²² The current balance heavily favors the band's unlicensed incumbents and fails to maximize the use of this high-value spectrum.

As the NPRM notes, in over ten years since the M-LMS rules have been enacted, no new M-LMS licensee has deployed service. In that time Part 15 devices in the 902-928MHz band have proliferated. To claim that the rules strike the right balance ignores the reality of the overly burdensome nature of the rules for M-LMS licensees. A more appropriate balance will allow for the growth of new technologies in the band that promote higher uses and greater sharing. This new balance will provide the proper incentives for both licensed and unlicensed systems to coexist in the band.

¹²¹ *Part 15 Coalition Comments* at 7-8. *CEA Comments* at 4.

¹²² *NPRM* ¶ 1.

D. Assertion: The NPRM Is Procedurally Defective

Havens asserts that the NPRM violates Sections 332 and 157 of the Communications Act.¹²³ However, a plain reading of both provisions supports the NPRM and its proposed flexibility changes. Section 332 requires that for spectrum management actions for private mobile services, the Commission consider whether these actions “improve the efficiency of spectrum use, ...provide services to the largest feasible number of users...or increase interference sharing opportunities between private mobile services and other services.”¹²⁴ The NPRM clearly intends to improve the efficiency of the M-LMS spectrum, provide services to the largest number of users, and increase sharing of the band.¹²⁵ Section 157 makes it the “policy of the United States to encourage the provision of new technologies and services to the public.”¹²⁶ The NPRM seeks to determine whether new technology exists that will make it feasible to change the service rules and technical limits for the band and, if so, whether new services could be made available to the

¹²³ *Havens Comments* at 35-36.

¹²⁴ 47 U.S.C. § 332 (2006).

¹²⁵ *NPRM* ¶¶ 18,19 (Seeks comments on whether Commission can promote more efficient use of the band that will provide services of greater value to the public and that will minimize interference to all users).

¹²⁶ 47 U.S.C. § 157 (2006).

public.¹²⁷ These statutory provisions clearly support the NPRM and do not substantiate Havens' contention that the NPRM flouts Congressional intent.

Havens also asserts, without merit, that the Commission's termination of the proceeding RM No. 10403 violates the Commission's own rules and the APA¹²⁸ and suffers from a lack of support in the law. The Commission sought comment on Progeny's Petition for Rulemaking on April 10, 2002.¹²⁹ The NPRM terminated the RM. No. 10403 proceeding, specifically noting the length of time that had passed.¹³⁰ Havens filing fails to point to any case law or APA provision that requires the Commission to rule on the Progeny Petition.

In addition, Havens' contention that the rulemaking is arbitrary and capricious and is violative of the Administrative Procedure Act also is not supported by case law and should be dismissed.¹³¹ Only final agency actions are reviewable.¹³² The issuance of the NPRM does not constitute a final

¹²⁷ *NPRM* ¶ 18.

¹²⁸ *Havens Comments* at 5.

¹²⁹ *See* Wireless Telecommunications Bureau Seeks Comment on Petition for Rulemaking Regarding Location and Monitoring Service Rules, *Public Notice*, 17 FCC Rcd 6438 (2002).

¹³⁰ *NPRM* ¶ 2, n 4.

¹³¹ *Havens Comments* at 51.

¹³² 5 U.S.C. §704 (2006).

agency action.¹³³ The Commission is building a record to determine whether the proposed changes meet the appropriate legal standards.

Elsewhere, Havens argues that the M-LMS rulemaking violates Sections 316 and 303¹³⁴ of the Communications Act is unsupported on the facts or by the law. Havens fails to provide any support to back up his conclusory proclamation that the NPRM fails to satisfy Section 316's public interest requirements. Havens' attack of the NPRM on these grounds is baseless and borders on the absurd. The NPRM is not a final agency action that is contestable on these grounds. Similarly, Havens invocation of Section 303(f) is fatally flawed on that same basis. Havens' poorly reasoned and legally unsupported conclusions should be disregarded and do not add anything meaningful to the Commission's decisionmaking process.

¹³³ *Franklin v. Massachusetts*, 505 U.S. 788, 797 (1992) (“The core question is whether the agency has completed its decisionmaking process.”)

¹³⁴ *Havens Comments* at 50.